

Digivance® NXD

Digital Distributed RF

High-Capacity, Multi-Operator, Multi-Band Digital Distributed Antenna System



ADC's Digital Advantage

ADC, a leading solution provider for distributing and enhancing wireless capacity and coverage, now offers the Digivance NXD. The Digivance NXD is a fully Digital Distributed Antenna System (D-DAS) designed to specifically meet a service provider's current network needs and provide a fully flexible path to future network migration. The Digivance product improves wireless networks by extending seamless wireless coverage from existing cell sites to hard-to-reach areas, or distributing capacity from centralized radio suites.

Digivance NXD is a member of ADC's family of digital radio frequency (RF) transport solutions that include the Digivance CXD, the Digivance Long-Range Coverage Solution (LRCS), Digivance Street-Level Coverage Solution (SCS), and the Digivance Indoor Coverage Solution (ICS). ADC leverages its expertise in wireless technologies, as the industry leader in fully digital, multi-frequency digital DAS network equipment, providing network operators with predictable and highly controllable RF coverage and capacity solutions.

Features

- Flexible architecture enables macro network coverage to be distributed over individual or multiple point-to-point optical RF transport links
- Optimized for neutral host operators, able to co-locate multiple operators at a single location
- Digital RF transport is transparent to air modulation standards; e.g., GSM, CDMA, etc.
- Individual modules for 800, 850, and 1900 MHz frequency blocks
- Field upgradeable in single block increments
- Digital simulcasting, system capable of digital switching of radio sectors
- Fully digital transport for precise system settings and management
- Open standard SNMP-based interface, remote control and alarming using commercial Network Management Systems (NMS)
- Local alarming and control using embedded Element Management System (EMS)

SPEC SHEET



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Overview

With the increasing popularity of wireless devices, subscribers expect to have coverage at any time in any place they may be. This requires service providers to increase capacity, typically done by adding new cell sites. However, with city center areas becoming more congested and local government zoning regulations increasingly more stringent, obtaining permits for new wireless cell sites is becoming very difficult. ADC's Digivance NXD is a cost effective solution for extending or distributing capacity from base stations to areas that require coverage, allowing the use of city right-of-ways and easements for radio and antenna locations.

Digivance NXD features the innovative FLEX technology that offers the option of one, two, three or four 15 MHz bands in a single cabinet. This technology also provides digital simulcasting -- the option of spreading the coverage of a BTS sector across two or more transmit/receive locations through digital signal processing. FLEX technology allows multiple variable simulcast arrangements for different bands or different RF technologies. In addition, this technology offers operators increased flexibility in meeting fluctuating capacity demands. By allowing service providers to change simulcast patterns through the use of remotely controlled digital cross-connect switches, FLEX technology can reallocate capacity and reduce BTS costs. This technology can also be integrated with Software Defined Radio (SDR) to enable wireless networks of the future.

Application

Digivance NXD is the most advanced long-range RF distribution solution offering a fully digital platform. By using patented digital RF transport technology, Digivance NXD digitizes the entire designated RF band, transports it over fiber, and reconstructs the signal at full bandwidth, regardless of modulation technology or data rate. Digital RF transport allows the signal to be replicated at full dynamic range, independent of the fiber length, which increases the capability for data throughput. As advanced high data rate broadband services are rolled out, networks designed using Digivance NXD are fully capable of supporting any air interface standard.

Digivance NXD Applications Include:

- Neutral host deployments
- Wide area and medium range urban and suburban microcells
- Capacity and coverage underlay to existing 2G and 3G sites
- Multi-frequency, multi-operator deployments
- Campus environments and business parks
- Stadium and convention centers

System Description

Digivance NXD is an all-digital RF distribution system that optically transports RF signals to specific coverage areas. The Digivance NXD comprises a centrally located hub where base stations are connected, via fiber optic cable, to a series of Radio Access Nodes (RANs). RANs may be mounted on light standards, utility poles, building walls, rooftops, or ground pedestals in the targeted design areas. The system is configurable and upgradeable in 15 MHz increments, with up to four independent frequency blocks multiplexed into a single digital link. A network operator can vary system frequency blocks on a point-by-point basis to match each individual market's network strategy.

The Digivance NXD RAN is positioned near the area requiring coverage and interfaces with an antenna to distribute the RF signal. The distance between the Digivance NXD hub and RAN unit is limited only by time delay requirements of system modulation standards; i.e., GSM, CDMA, etc. Optionally, the coarse wave division multiplexing (CWDM) features allow transport of multiple digital RF digital links over a single fiber.

Multiple Digivance NXD links can be readily deployed as a system to distribute capacity and provide coverage to larger areas, such as an entire city center area. The Digivance SNMP interface provides operational and maintenance capabilities for an unlimited number of NXD links.



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Digital Quality

ADC's Digivance digital platform gives a network operator the feature set it needs to build high quality networks for its customers. The Digivance system offers precise time delay control, high dynamic range, and predictable performance over time, distance, and temperature.

ADC's D-DAS technology allows for digital simulcasting of radio sectors for seamless capacity distribution and improved network efficiencies. Simulcast patterns and sector planning can be dynamically modified using ADC digital switching technology for changing usage patterns and improved management of base station resources

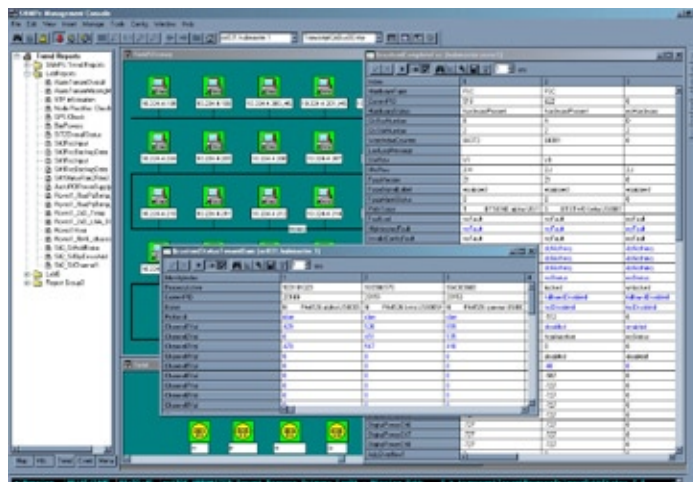
Unmatched Network Control

The rich feature set of the Digivance system, along with the advantages of digital RF transport, enables network operators to configure, optimize, and operate their networks securely and independently on a frequency block basis. Centralization of base station capacity can also be realized using Digivance NXD, allowing wireless service providers to further benefit by reducing capital expenditures and annual operating costs. Networks can be designed and configured to satisfy current coverage and capacity needs, and easily adapt and migrate as consumer demands dictate, through the deployment of additional RANs to the network, or the addition of more channel capacity at the central hub. All system hardware elements can be remotely monitored and controlled via a Digivance SNMP interface into commercially available NMS

With the Digivance architecture, an operator's network is ready to meet today's needs and those required in the future.

Benefits

- Individual modules for each frequency block
- Common carrier system for all wireless operators
- Independent power amplifiers for each frequency block, autonomous operation of multiple services
- Fully digital for precise system settings and management
- Open standard SNMP-based Element Management System
- Battery backup options, glitch and 1-2 hour internal
- Secure and reliable digital fiber transport
- Compatible with E911 Network Overlay and GPS-based position location services



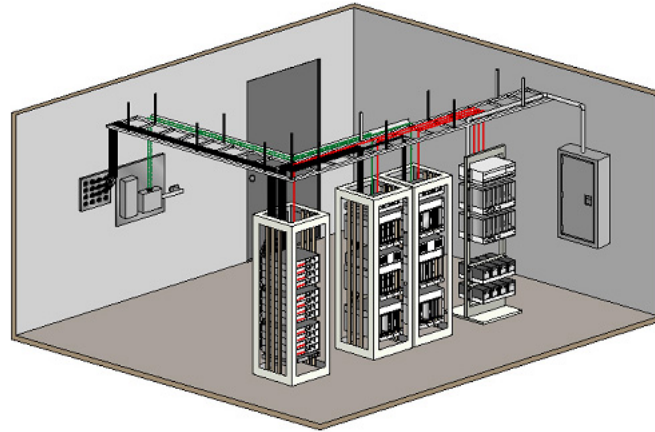
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Digivance NXD Hub

The Digivance NXD hub is typically located at a remote BTS or a facility building housing a suite of base stations near the area requiring coverage. On the forward path, the system digitizes the designated RF band, electrically multiplexes signals with other RF bands into a single digital link, and transports it over singlemode fiber to the remote unit. The system can also digitally simulcast multiple remotes from a single base station sector. On the reverse path, the system receives the digitized signals from multiple RANs and converts them to RF. The hub performs all monitoring, control and alarming of information for the RAN.

For large system deployments, multiple NXD links are networked together at the hub. Remote alarm monitoring and control of the Digivance NXD system can be performed from an off-site location or NOC using an open standard SNMP interface.

Digivance NXD RAN

The Digivance NXD RAN is an outdoor cabinet that is either pole-mounted, floor mounted, or mounted on the side of a building. On the forward path, the RAN receives the digitized RF digital link from the hub, separates each frequency block being transported, and converts the signal back into RF to be distributed via an externally mounted antenna. On the reverse path, the unit digitizes the designated RF bands, electrically multiplexes the signals onto the digital RF link for transport over a single-mode fiber to the hub.



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Specifications

FORWARD PATH

System Bandwidth:	15 MHz block increments
Bandwidth Capacity:	4 frequency blocks per unit (800, 850, 900 & 1900) Future expansion to 6 per unit

FREQUENCY RANGE

Cellular A/A' Band:	869 to 880 MHz
Cellular B/B' Band:	880 to 894 MHz
SMR 800 Band:	855 to 866 MHz
SMR 900 Band:	935 to 940 MHz
PCS A Band:	1930 to 1945 MHz
PCS D Band:	1945 to 1950 MHz
PCS B Band:	1950 to 1965 MHz
PCS E Band:	1965 to 1970 MHz
PCS F Band:	1975 to 1980 MHz
PCS C Band:	1980 to 1990 MHz
Intermodulation:	-60 dBc at remote output (two tone)
Spurious:	-60 dBc
Peak to Average Ratio:	10 dB
Propagation Delay:	12 microseconds forward path (excluding fiber)
Adjustable Delay Setting:	0 - 566 microseconds
Delay Setting Adjustments:	13 nanosecond increments, automatic or manual
RF Input Level:	-25 to + 10 dBm per RF Band (non-duplexed)

OUTPUT POWER

Cellular/SMR 10 Watt MCPA:	6.5 Watts (+38 dBm) Composite at Antenna Port
PCS 20 Watt MCPA:	12.5 Watts (+41 dBm) Composite at Antenna Port

PERFORMANCE MERIT FUNCTIONS:

TDMA/EDGE:	5% EVM
GSM:	3.5° RMS
iDEN® :	SQE decrease < 1 dB
CDMA:	0.98 rho factor



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REVERSE PATH

System Bandwidth:

15 MHz band block increments

FREQUENCY RANGE

Cellular A/A' Band:

824 to 835 MHz

Cellular B/B' Band:

835 to 849 MHz

SMR 800 Band:

810 to 821 MHz

SMR 900 Band:

896 to 901 MHz

PCS A Band:

1850 to 1865 MHz

PCS D Band:

1865 to 1870 MHz

PCS B Band:

1870 to 1885 MHz

PCS E Band:

1885 to 1890 MHz

PCS F Band:

1890 to 1895 MHz

PCS C Band:

1895 MHz to 1910 MHz

Gain:

-10 to +35 dB

Out-of-band Rejection:

90 dB

Propagation Delay:

17 microseconds reverse path (excluding fiber)

Adjustable Delay Setting:

0 - 566 microseconds

Delay Setting Adjustments:

13 nanosecond increments, automatic or manual

Input IP3:

-21 dBm

Noise Figure 800/850/900:

5 dB

Noise Figure 1900:

6 dB

Maximum RF Output Level:

10 dBm absolute maximum, -5 dBm operational maximum

Automatic Gain Limiting (AGC) Range:

25 dB

Maximum Input for AGC:

-38 dBm peak

Reverse Path VSWR:

2.0:1

OPTICAL SPECIFICATIONS

Fiber Type:

Single-mode, 9/125 μ m

Fibers Required:

1 pair per RAN, 1 pair 8 RANs with CWDM option

Transmit Device:

SFP optical transceiver

Fiber Connectors:

Dual-LC

Forward/Reverse Path Wavelength:

1310 nm Standard Range

1550 nm Long Range Option

Optical Budget:

9 dB Standard Range

26 dB Long Range Option

CWDM Wavelength Option:

8 Wavelength ITU-T G.694.2 grid CWDM



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POWER SPECIFICATIONS

Hub Unit Power Source:	-48 VDC floating
Hub Unit Input Current:	34A @ -42 VDC per rack
RAN Unit Power Source:	176 - 275 VAC
RAN Unit Input Power:	1600 W with four bands supported
Redundant Power Supply:	Hub and RAN Optional
RAN Battery Backup (Optional):	2 to 4 hours internal
SNMP and Element Management	
SNMP Protocol:	SNMP v1 & v2
Resource Management:	Automatic Hub and RAN discovery
Alarm/Fault Notification:	SNMP traps
EMS Minimum Equipment Required:	PC with Windows® operating system (Windows® 95, 98, NT, 2000) <ul style="list-style-type: none">• CD-ROM drive• Standard Web Browser• Available Ethernet Port

PHYSICAL

Hub Rack	
Dimensions (HxWxD):	1981.2 mm x 609.6 mm x 609.6 mm (78" x 24" x 24")
RF Connectors:	SMA Female
RAN	
Dimensions (HxWxD):	914.2 mm x 787.4 mm x 584.2 mm (0.425 m3) 36" x 31" x 23" (15 cubic feet)
Weight:	140 kg (310 lbs.)
Color:	Putty White
Remote Unit Enclosure:	NEMA 3R
Mounting Options:	Wall mount; pole mount or pedestal mount brackets available
RF Connectors:	N-Type Female

OPERATING ENVIRONMENT

Hub Rack	
Temperature:	0° to 50° C (32° to 122° F)
Humidity:	95% non-condensing
RAN	
Operational Temperature:	-40° to +50° C (-40° to 122° F)
Cold Start Temperature:	-20° C (-4° F)
Storage Temperature:	-40° to +85° C (-40° to 185° F)
Humidity:	95%

Ordering Information

Please contact your sales representative or customer service at
1.800.366.3891 ext. 73022 for ordering information

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